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1. An emitter comprising:

an electron supply layer;

an oxide layer on said electron supply layer defining an emission area; and

an emission layer in the emission area and in contact with said electron supply layer, said emission layer being formed by a rapid thermal process and selected from a group comprising SiO<sub>2</sub>, SiO<sub>x</sub>N<sub>y</sub> and combinations thereof.

- 2. The emitter according to claim 1, wherein said emission layer is in the approximate range of 50-150Å.
- 3. The emitter according to claim 2, wherein said emission layer comprises an approximate  $20\text{\AA}~\text{SiO}_2$  layer and a  $\text{SiO}_x\text{N}_y$  layer in the approximate range of 30-130~Å.
- 4. The emitter according to claim 1, wherein said emission layer comprises an approximate  $20\text{\AA}~SiO_2$  layer and a  $SiO_xN_y$  layer in the approximate range of 30-130~Å.
- 5. The emitter according to claim 1, wherein the emitter includes means for creating an electrical field to stimulate tunneling.
  - 6. The emitter according to claim 5, wherein the means for creating comprises a metal contact structure and a thin metal layer disposed over said metal contact structure and said emission layer.
  - 7. The emitter according to claim 6, wherein said thin metal layer is selected from a group comprising Pt, Au, Ta and combinations thereof.

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- 8. The emitter according to claim 7, wherein said thin metal layer is approximately 50 100Å.
- The emitter according to claim 6, wherein said metal contact
  structure is part of a circuit interconnect metal structure in an integrated circuit including other devices.
  - 10. The emitter according to claim 5, wherein the emitter is disposed relative to a memory medium to direct emissions toward the memory medium and thereby cause an effect in said memory medium.
  - 11. The emitter according to claim 5, wherein the emitter is disposed relative to a display medium to direct emissions toward said display medium and thereby cause an effect in said display medium.
  - 12. The emitter according to claim 5, wherein said electron supply layer comprises a silicon or polysilicon substrate and the emitter is disposed on said silicon or polysilicon substrate with emitter control circuitry to control the emitter.

13. A method for forming an emitter, comprising the steps of:

forming a patterned oxide layer to define an emission area upon an electron supply layer; and

with a rapid thermal formation process, forming an emission layer, within said emission area, of a material selected from a group of materials comprising SiO2,  $SiO_xN_y$  and combinations thereof.

- 14. The method of claim 13, further comprising a step of forming a metal contact structure on the pattered oxide layer.
- 15. The method of claim 14, further comprising a step of forming a thin metal layer on the emission layer and the metal contact structure.

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- 16. The method of claim 14, wherein the metal contact structure comprises a single metal layer.
- 17. The method of claim 14, wherein the metal contact structure 5 comprises multiple metal layers.
  - 18. The method of claim 13, wherein said step of forming an emission layer comprises forming an approximate  $20\text{\AA SiO}_2$  layer and a  $\text{SiO}_x\text{N}_y$  layer in the approximate range of 30-130 Å.
  - 19. The method of claim 13, performed as part of an integrated circuit formation process to form the emitter as part of an integrated circuit including emitter control circuitry.
    - 20. An integrated emitter circuit comprising:
    - a silicon or polysilicon substrate;

an oxide layer on said silicon or polysilicon substrate defining an emission area;

an electron emission layer in the emission area and in contact with said silicon or polysilicon substrate, said electron emission layer being formed by a rapid thermal process and selected from a group comprising SiO<sub>2</sub>, SiO<sub>x</sub>N<sub>y</sub> and combinations thereof;

a circuit interconnect electrical contact structure on said oxide layer; and

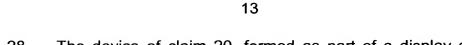
- a thin metal layer on said electron emission layer and said electrical contact structure.
- 21. The device of claim 20, wherein said electron emission layer comprises an approximate  $20\text{\AA}~\text{SiO}_2$  layer and a  $\text{SiO}_x\text{N}_y$  layer in the approximate range of 30-130~Å.
- 22. The device of claim 21, wherein said thin metal layer is selected from a group comprising Pt, Au, Ta and combinations thereof.

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- 23. The device of claim 20, wherein said thin metal layer is selected from a group comprising Pt, Au, Ta and combinations thereof.
- 5 24. The device of claim 20, wherein said electrical contact structure comprises part of a circuit interconnect pattern connecting the device to other devices in an integrated circuit.
  - 25. The device of claim 20 formed as part of an integrated circuit in a memory device, the memory device using electron emissions from the electron emitter to cause an effect in a memory medium disposed opposite the emitter.
  - 26. The device of claim 20, formed as part of a memory device, the memory device including a plurality of the emitters and comprising :
  - a lens for focusing an electron beam from the emitter to created a focused beam; and
  - a memory medium in close proximity to the plurality of emitters, the memory medium having a storage area being in one of a plurality of states to represent information stored in the storage area, the states being responsive to the focused beam such that
  - an effect is generated in the storage area when the focused beam impinges upon the storage area;
  - a magnitude of the effect depends upon the state of the storage area; and
- information in the storage area is read by measuring the magnitude of the effect.
  - 27. The device of claim 26, further comprising:
  - a mover to position said memory medium with respect to the plurality of emitters; and
    - a reader circuit integrated in said mover.



- 28. The device of claim 20, formed as part of a display device, the display device further comprising:
  - a lens for focusing an electron beam from the emitter; and a coating on the lens to capture electrons from the emitter.
- 29. The device of claim 28, wherein the electron beam from the emitter comprises a visible light source.
- 30. The device of claim 20, formed as part of a display device, the 10 display device further comprising:
  - a lens for focusing an electron beam from the emitter; and
  - a display medium in close proximity to the emitter, the display medium producing a visible emission in response to the focused beam.